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Original communication

A study of sudden natural deaths in medico legal autopsies in University Malaya Medical Centre (UMMC), Kuala Lumpur

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Abstract

The main aim of this study is to determine the causes and the epidemiological aspects of sudden natural deaths. Data were collected from 545 sudden natural autopsies in UMMC, Kuala Lumpur over a five-year period, from 1st January 2000 to 31st December 2004. There were 475 males and 70 females. The largest number of sudden natural deaths was in the age group of 41–50 years. 35.8%, 30.5% and 11.7% of the patients were Chinese, Indian and Malay, respectively. A majority of the patients were married (59.8%) and came from the semiskilled–unskilled group (30.6%). The monthly distribution was almost constant. Cardiovascular diseases were the most important cause contributing 64.9% in sudden natural deaths.

Keywords: Sudden natural deaths; Semiskilled–unskilled group; Cardiovascular diseases

1. Introduction

Natural death means the death occurring due to the natural diseased or pathological condition, old age, debility or devitalisation, in which death is not intended or attempted and also does not occur accidentally.

Sudden death is a death which is not known to have been caused by any trauma, poisoning or violent asphyxia, and where death occurs all on a sudden or within 24 h of the onset of the terminal symptoms.

Thus, by definition sudden deaths are mostly natural deaths where deaths occur immediately or within 24 h of the onset of terminal symptoms, which may be totally different from the symptoms, which the patients were having so long.[1]

WHO defines sudden death officially as someone who dies within 24 h of symptoms appearing, but in forensic sense, most of such deaths die in minutes or even seconds of the onset of symptoms. Sudden death is not necessarily unexpected and unexpected death is not necessarily sudden, but very often the two combination coexist.[2]

Sudden deaths can be classified into two groups: the first in which the autopsy of deaths reveals a lesion which is not compatible with life because of its nature, sites, or extent, for example the rupture of an aortic aneurysm or a massive intracerebral hemorrhage involving in the brain stem. The second group, is having a large proportion of deaths from natural causes. Some lesion is found at autopsy which may have caused death but which is also compatible with continued life e.g. arteriosclerosis of coronary arteries. In these cases the failure to detect any other causes of death is presumptive evidence that the lesion was responsible for the death but is not conclusive proof. Therefore, the clinical history is often of value in determining the probable cause of death in such circumstances.[3]

Past studies have shown that cardiovascular disease was the most important cause of the sudden natural death. It was followed by respiratory disease, central nervous system disease and others.

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Autopsy or postmortem examination literally means a scientific examination of a dead body done by Forensic Pathologists. In many cases, though there is no foul play suspected, but the causes of death are not known. In such circumstances, as per birth and death registration act, death has to be registered and cause of death has to be determined. Hence, in Malaysia, in all such cases, where cause of death is unknown even without any foul play, autopsy is mandatory and coroners are involved and autopsy becomes the medico legal autopsy.

Several factors such as age, sex, ethnicity, occupation and marital status may also influence the sudden natural death which will be evaluated during this research.

2. Materials and methods

The study sample comprised all medico legal autopsies done in the Department of Forensic Pathology, Faculty of Medicine, University of Malaya from 1st January 2000 to 31st December 2004, covering a span of five years for the study. Sudden deaths due to natural causes were identified and the following data was registered into SPSS (version 11.0), a computer database, and analyzed for the age, sex, ethnic background, marital status, climate and causes of the death of each victim. Graphs were made by using Microsoft Office Excel.

This includes all the sudden deaths where cause of death were not known, whether person died in the house or in the hospital. There is no discernable certified cause of death in many hospital deaths and in all the deaths at home. All such deaths where cause of death is unknown are reported to the Coroners and he in turn requests for autopsy Cases having unascertained cause of death, in spite of meticulous autopsy performed, have been excluded from the study.

3. Results

Out of the total autopsies done in five-year period, 18.8% were sudden natural deaths and majority of them were males (87.2%) (Table 1).

The maximum number of cases was in the age group of 41–50 years (32.5%) (Fig. 1), of which 35.8% were Chinese and 30.5% were Indians (Fig. 2).

Most of the deceased were married (59.8%) (Table 2).

Semiskilled–unskilled and clerical–skilled group constituted 30.6% and 14.1% of the deceased, respectively (Fig. 3).

Table 1
Sex of the deceased

Sex	Frequency (*n*)	Percentage (%)
Male	475	87.2
Female	70	12.8
Total	545	100.0

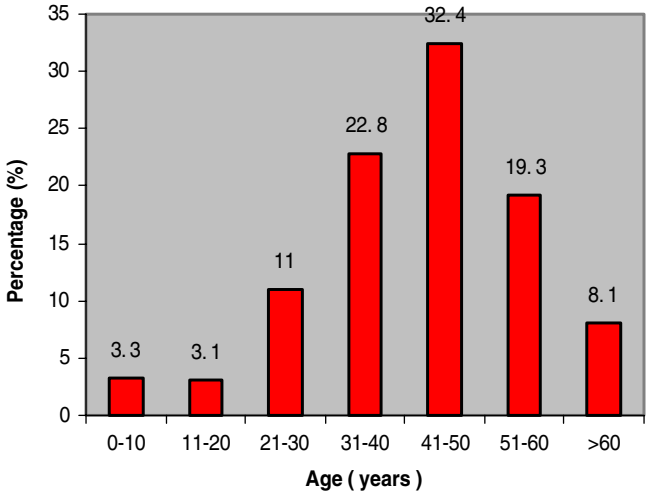

Fig. 1. Age of the deceased.

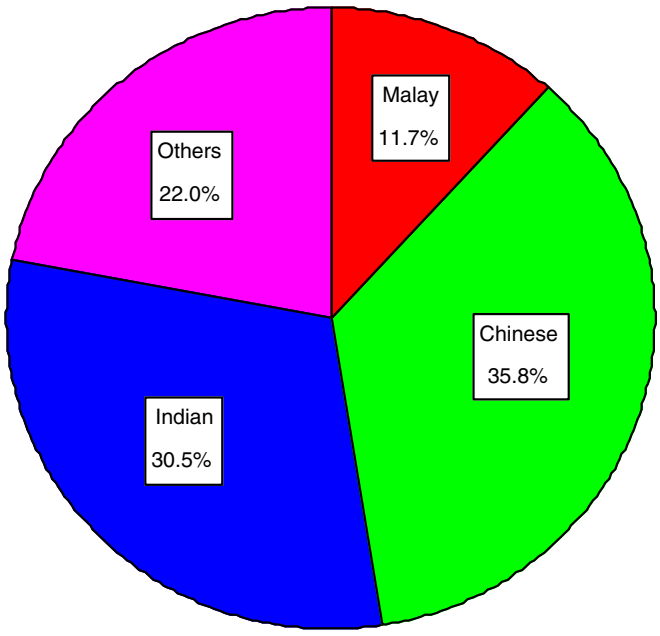

Fig. 2. Ethnicity of the deceased.

Table 2
Marital status of the deceased

Marital status	Frequency (*n*)	Percentage (%)
Single	105	19.3
Married	326	59.8
Separated	10	1.8
Unknown	104	19.1
Total	545	100.0

60.9% of the cases occurred during 12.00 noon to 12.00 midnight, while monthly distribution was almost constant (Tables 3 and 4).

64.9% of the deaths were due to cardiovascular diseases (Fig. 4).

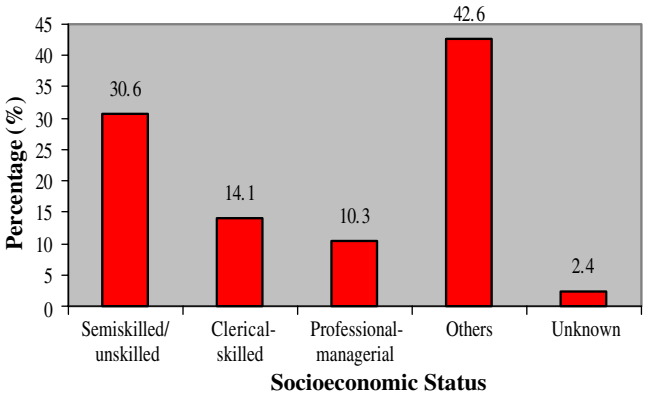

Fig. 3. Socioeconomic status of the deceased.

Table 3
Time of deaths

Time (h)	Frequency (*n*)	Percentage (%)
0001–0600	110	20.2
0601–1200	103	18.9
1201–1800	176	32.3
1801–2400	156	28.6
Total	545	100.0

Table 4
Month of deaths

Month	Frequency (*n*)	Percentage (%)
January–March	132	24.2
April–June	128	23.5
July–September	135	24.8
October–December	150	27.5
Total	545	100.0

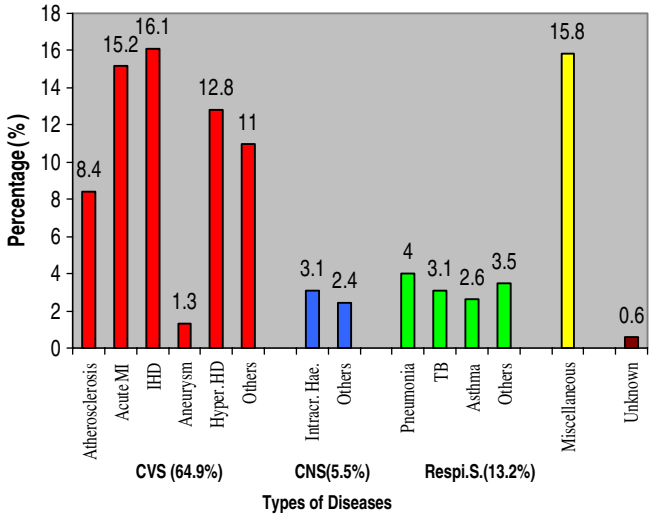

Fig. 4. Causes of deaths: MI, Myocardiac Infarction; IHD, Ischaemic Heart Disease; Hyper.HD, Hypertensive Heart Disease; Intracr. Hae, Intracranial Haemorrhage; TB, Tuberculosis; CVS, Cardiovascular System; CNS, Central Nervous System; Respi.S, Respiratory System.

4. Discussions

A total number of 2895 medico legal autopsies were conducted in the Department of Forensic Pathology, Faculty of Medicine, University of Malaya from 1st January 2000 to 31st December 2004. The mortuary of UMMC (University Malaya Medical Centre) is one of the four autopsy centers in Kuala Lumpur, which has the population about 2 million. One of the common indications for the autopsies was sudden natural deaths (18.8%) and this is similar to findings in USA, United Kingdom and Nigeria.[4–6]

In the present study, there were 545 cases (out of 2895 of autopsies performed) of sudden natural deaths cases throughout the five-year study period.

Older patients are more commonly represented in series of sudden natural deaths.[7,8] However, in the present study; the peak age group was the fourth decade accounting for 32.5% of the cases as against the average age of deaths in entire Malaysia as 72.24 years.[9] This indicated people getting diseases in younger ages compared to people in the past and of the different autopsy centre. Male persons in general are at higher risk for sudden natural deaths (M:F ratio = 6.75:1).[10–12]

Being a multiracial country, Malaysia consists mainly of Malay, Chinese and Indian. Nowadays, due to migration of foreign workers into Malaysia for job, the number of other races is increasing. Bangladesh, Indonesian, Sikh, Vietnam and Philippines form a small proportion of Malaysia population. Sudden natural deaths occurred predominantly either in Chinese or in Indian, probably because of their food habits or genetic factor. Malay though constituted 60% of the population but the sudden deaths cases were less in the present study. The reason might be the reluctance of these communities for autopsy.

Marital status and occupation of the deceased were studied as well. Most of the deceased were married as the occurrences of the sudden natural deaths increase with aging.

The deceased were from a variety of socioeconomic status. They were categorized into three groups based on their occupation: semiskilled–unskilled, clerical–skilled and professional–managerial. A majority of them came from the first group (30.6%) which comprises labourers, factory workers, drivers and so on. This group basically has lower income compared to another two groups. Due to the financial problem, they might not get regular medical check up for early detection of their diseases or even treatment for their diseases. Professional–managerial group contributed the least to the sudden natural deaths. Managers, executives and engineers are highly educated. They had better knowledge and were more aware of the importance of health. Their economy status also allowed them to have a better nutrition and healthier lifestyle. Group of others showed a significant number in this study. Since most of the deceased were in the advancing age, most of them were unemployed or were pensioners.

Studies on diurnal and monthly variations in sudden natural deaths have been less carried out. In this study, more cases were recorded during 12.00 noon to 12.00 midnight. This was because people were more active in this period. However in every quarter of year, the numbers of cases recorded were almost constant. Malaysia is a tropical country. There is no significant change in the season throughout the year.

Usually, deaths are declared due to non-functioning of brain, heart or lung, which constitute the Tripod of life. By far, where a natural death is very rapid, perhaps virtually instantaneous, the cause is inevitably cardiovascular disease, due to the frequency of death without premonitory symptoms.[2] In the present series of study, cardiac deaths comprised more than half of the cases. These cardiac cases were mainly due to acute myocardiac infarction (MI), ischaemic heart disease (IHD) or hypertensive heart diseases (acute MI has been separately taken from IHD). Other cardiovascular diseases such as aortic valve diseases, cardiac temponade, cardiomyopathy and myocarditis were also found in the present study. This is consistent with the findings of Cohle et al.,[10] Sarkioja et al.[11] and Morentin et al.[12] separately in their studies.

Respiratory disorders were the second most common causes of the sudden death after cardiovascular diseases, consisting mainly of pneumonia, tuberculosis and asthma. The previous studies have also shown the similar findings.[13] Approximately 3.5% of cases were due to other respiratory diseases such as aspiration, chronic obstructive embolism and lung cancer.

Another main cause of sudden death was central nervous system disorders which constituted 30 cases. More than half of these cases died due to intracranial haemorrhage.

Miscellaneous causes included liver failure, peptic ulcer, diabetes mellitus, peritonitis, carcinoma, hepatitis and so on. There were three cases in which, though the causes of deaths were natural, were disputed.

5. Conclusion

Overall, males in the age of fourth decade were at increased risk in sudden natural deaths. Most of the deceased were married and came from semiskilled–unskilled group. Sudden deaths occurred predominantly amongst Chinese and Indian.

Cardiovascular diseases were the foremost cause of sudden natural deaths, followed by respiratory system diseases and central nervous system disorders.

Through conditional logistic analysis, the following risk factors emerged and were closely related to the occurrence of sudden death: long-term stress, history of heart disease, hypertension, chest symptoms, autonomic disturbance, short-term stress and a smoking habit.[12]

This study supports the importance of complete forensic autopsies in order to encourage epidemiological and preventive studies on sudden deaths.

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